COMPUTER SYSTEM AVAILABILITY

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All mechanical systems worldwide share a common thread; they periodically need maintenance, tuning, and changes/upgrades. Our data center at OIR is no exception. Due to new customers and the inflexible operational needs their agency's mission dictates, our mainframe maintenance windows have diminished.

OIR's host processor and software products require periodic maintenance and user changes. Application or network modifications requested by our customers require downtime to implement. OIR is a service, non-appropriated agency and depends on its customer base for revenue. We have new and existing customers that cannot afford downtime for changes or maintenance. Several examples are the Department of Corrections, the Department of Revenue, and the Department of Public Safety.

Due to the nature of our business, downtime for modifications and maintenance is a necessity. However, we have customers that cannot experience downtime, such as the Department of Public Safety's Highway Patrol officers cannot issue citations if the system is inaccessible. Another example is the Department of Corrections uses our computer systems to automate many antiquated manual functions. If the system is down, statewide prisons cannot efficiently operate. The impact is tremendous on our customers and OIR staff.

Vendors that support OIR and its customer base are also affected. Vendors such as IBM, Hitachi, Unisys, electricians, plumbers, communications equipment folks all need certain periods of downtime to perform their needed duties.

Without downtime, hardware and software levels become static. Performance, creativity, and expansion ceases to exist due to the lack of necessary change. Most customers depend on our staff to make their needed changes. We add/delete terminals, printers, new users, and add new functions to their software programs.

We presently test and implement changes from 7 p.m. to 10 p.m. on Sunday nights. With the addition of new customers and additional functions of existing ones, we may lose the Sunday night window we presently have. A true 24-hour by 7 day per week availability is necessary. When can changes be tested and implemented? This is the problem we face: a methodology to implement system changes and system maintenance with minimum to no inconvenience for our customers/ community. We also must be sensitive to our technical support staff and equipment vendors who make the majority of those changes. Late night and weekend maintenance windows are not widely accepted. Budget considerations are necessary because a solution must be cost effective.

Our goals were as follows:

A. To establish a mechanism to test and implement system changes with

minimal customer disruption.

B. To avoid solutions that involve extreme hours or heavy weekend workloads.

The objectives were clear. We had to design and implement a solution to a very sensitive problem. I proposed this problem to OIR's management and the support staff. It was apparent this needed to become a priority item. Management proposed that we proceed immediately to resolve the situation. A team was created to explore and evaluate ideas. The team members were comprised of all personnel that were directly affected. A meeting was scheduled and team meeting techniques were encouraged. A team leader was chosen and all team rules were observed. They used the "L.E.A.D. Model" (Fran Rees) as an example for team involvement.

They exercised the round-robin style of brainstorming to evaluate all possibilities. Advantages of this type are minimal domination; participants may pass; discussion is focused; participation is encouraged. Results of the brainstorming sessions were as follows:

A. Continue to implement and test late Sunday nights.

B. Purchase a second processor and configure it to parallel our production processor. This second processor would then be our test vehicle.

C. Partition a portion of our existing processor for testing purposes.

The team felt that these were our best and only options to solve our problem. Now that there were three clear objectives, the team used force field analysis techniques to identify forces that would influence our goal.

A flip chart was used and labeled with restraining and driving forces as the two headings. Each possibility discovered in the brainstorming session was analyzed. Results were as follows.

Objective - Continue as normal

Restraining Forces

- **Personnel overworked**
- **Only 52 chances per year**
- **Work all week with only 3 hrs. to test**
- **Less productive**

Driving Forces

- **Nothing needs to be done**
- **Inexpensive**

Objective - Purchase Second Processor

Restraining Forces	Driving Forces
- Very expensive	- Able to test during the day
- 2 copies of all software must be purchased & maintained	- Less weekend & after hrs. work
- Much up-front work would still be needed	- More productive

Objective - Use Portion of Existing Processor

Restraining Forces	Driving Forces
- System resources would diminish	- More test time availability
- Setup requires much initial work	- Less expensive if not no-expense
- Staff would be required to orient themselves to change	- Less weekend & after hrs. work
- Staff will initially resist change	- We could facilitate a true 24-hour x 7-day availability
- Staff would need to coordinate testing	- More productive
- Limitations still exist	

A weighted vote was taken. Priority of choices was allotted:

3 points - most important

2 points - next most important

1 point - least important

The team leader recorded each member's ratings and recorded each sum beside the appropriate item. This method indicated how important each item was to the voter. A pie chart representing percentages of the voted outcomes are shown in Appendix A. The selected method to solve our dilemma was too split our current processor into another partitian and configure it identically to our production system. This will allow the staff to test and debug during the day. After changes or new products are rigorously tested, they can be moved to the production system with minimal effort and downtime. Now that a solution has been chosen, an implementation project plan was needed. The project draft was developed by the staff involved and is as noted in Appendix B. The project plan was divided into two sections, preparations and implementation.

This portion of the project is currently complete. These next actions are what we proposed to do to achieve an ultimate completion of our endeavor. We will track all issues and items as we proceed through the plan. We can measure these objectives by time lines using estimated and actual completion dates. We are not concerned with costs due to the minimal amount needed to complete the project. Management

decisions will be needed on several key items such as no-charge contracts and reporting evaluations.

One major concern is change. The staff will be asked to do basic functions differently than before. Change must be managed properly. New ways to do old habits will be necessary. "The Twelve Ways to Manage Change" (CEQA, 1996) will be used by our management to incorporate new activities. It is imperative we integrate the new plans immediately. New and different activities involve new learning characteristics. "The Experimental Learning Model" (CEQA, 1996) is indicative of what our staff must do to achieve these new functions. If management observes these techniques, it will go a long way towards achieving new goals.

Monitoring and feedback are two methods we hope to use to measure and evaluate the process. Management can monitor the progress of the project by using the completion fields in the project plan. Tracking the development of the new system should be easily monitored. Upon completion and after several weeks of settling in, we propose to solicit customer feedback on how the new system functions. Over a period of time we should also be able to track how long a project takes to implement compared to previous ways. We will also have internal staff meetings to evaluate the new system. Feedback from our internal and external customers are essential. Baseline data will also be used to quantify the measurements. Current maintenance overtime hours and system downtime will be compared against future projections.

Assuming 4 hours overtime weekly over the next 6 months, we will work around 96 overtime hours. Upon completion of our project, we project only 24 hours of overtime devoted to maintenance. Current scheduled system downtime is 12 hours per month. Upon completion, suggested monthly downtime could be as minimal as 3 hours.

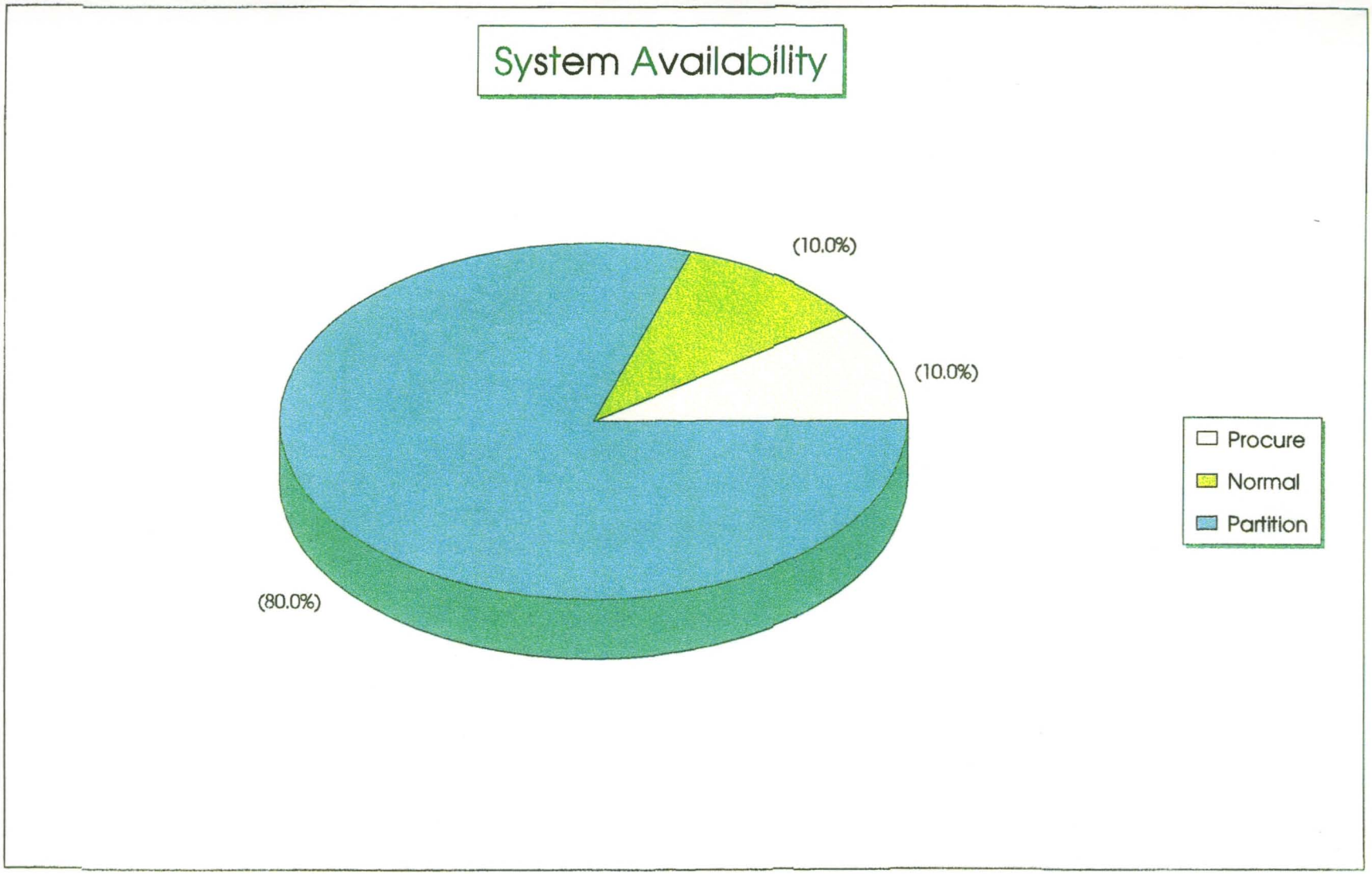
The repercussion from this project will be felt by all customers of OIR. Our internal staff will now have the mechanism needed to test and implement at will. Our external customers will also have the necessary platform to perform testing and changes they need. This project can be completed at a minimal cost to OIR. Almost nothing needs to be purchased to meet our goals. The benefits definitely outweigh the disadvantages. Another result of this project is a moral booster for the Technical Services staff. They should be more productive with less weekend and after-hours work.

LIST OF WORKS CITED

Center for Education, Quality, and Assessment. 1996. The Effective Manager. Columbia, SC.

Rees, F. Activities for Teams.

l:/sdavis/lpscpm



APPENDIX B

OIR/IPC

System Availability Preparation and Implementation Plan

Migration to PR/SM

MIGRATION TO PR/SM 1996	Est. Comp.	Actual Comp.

I. Preparations

A. Read manuals on PR/SM

B. Contact vendors to get additional authorization codes/stmts

1. CA - Sherri Patterson (770) 916-3710

   OK - uses last 4 digits of CPU s/n
   (call 1-800-338-6720 if need temporary key)

2. Allen Systems - Shelly Walker (941) 435-3624

   OK - uses last 4 digits of CPU s/n

3. SAS - OK - uses last 4 digits of CPU s/n

4. Compuware - OK - uses last 4 digits of CPU s/n

C. Contract with IBM for hook up of channel cables

No charge

D. Contract with HDS for hookup of channel cables

No charge

E. Channel cables

1. Determine # of & length of channel cables needed

   a. Order channel cables

2. Lay & hookup channel cables per detailed plan

F. Plug addresses in DASD controllers

G. Determine LPAR CPU Ids

1. ESA production - 73844 (no change)

2. ESA test - 13844

H. Determine LPAR setup

1.	Partition names		MVSPROD	MVSTEST
2.	ID		7	1
3.	Mode		ESA	ESA
4.	Storage	INIT	442MB	64MB
		RSVD	0MB	0MB
		ORIG	0Mb	442MB
5.	Exp storage	INIT	448MB	64MB

		RSVD ORIG	0MB 0MB	0MB 448MB
6.	CPU		Shared	Shared
7.	#CPs		6	1
8.	AutoIPL		N	N
9.	Processing weights		500	100
10.	Processor running time		Event	Event

I. Perform IOGEN to support ESA production on 1 LPAR & ESA test on 1 LPAR (A3 IOCDS & 13 IODF)

MIGRATION TO PR/SM 1996	Est. Comp.	Actual Comp.

II. Implement ESA production as an LPAR

A. Switch from Basic to LPAR

1. Bring down ESA as per TECHNOTE after Checklist procdures
2. Release current config (CONFIG)
3. Select LPAR IOCDS (IOCDSM)
4. Select LPAR CP Mode (CONFIG)
5. Perform POR (CONFIG)
6. Set up LPAR definitions (LPDEF)
7. Activate logical partition MVSPROD (LPDEF)
8. Activate logical partition MVSTEST (LPDEF)
9. Define Processing weights (LPCTL)

   Note: Must change access level to full (ACCESS)
10. SETLP MVSPROD
11. IPL MVS/ESA as an LPAR
12. LOCKLP ALL
13. Set up SAD display and activate

B. Train operators in use of LPAR

C. Develop documentation & distribute

1. TECHNOTES
2. Memos

D. Evaluate RMF reports to identify PR/SM overhead

E. Update SAS programs displacements

1. CPU utilizations
2. Paging rates

MIGRATION TO PR/SM 1996	Est. Comp.	Actual Comp.

III. Implement ESA test as an LPAR

A. Develop & distribute documentation

1. Technotes

2. Memos

3. Procedures

MIGRATION TO PR/SM 1996	Est. Comp.	Actual Comp.

IV. Post Implementation

A. Adjust LPAR if needed

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